What is claimed:

1. A thermal treatment system, comprising:

a heat applying element for generating a thermal dose used to ablate a target mass in a patient;

a controller for controlling thermal dose properties of the heat applying element;

an imager for providing preliminary images of the target mass; and

a planner for automatically constructing a treatment plan, comprising a series of treatment sites that are each represented by a set of thermal dose properties.

2. The treatment system of claim 1, wherein the thermal dose properties translate, at least in part, to electrical and mechanical properties of the heat applying element.

3. The treatment system of claim 1, wherein the planner automatically constructs the treatment plan based on input information including one or more of:

a volume of the target mass,

a distance from a skin surface of the patient to the target mass,

a set of default thermal dose prediction properties,

a set of user specified thermal dose prediction properties,

physical properties of the heat applying elements, and

images provided by the imager.

4. The treatment system of claim 3, wherein the default thermal dose prediction properties are based on a type of clinical application and include at least one of:

thermal dose threshold,

thermal dose prediction algorithm,

maximum allowed energy for each thermal dose,

thermal dose duration for each treatment site,

cooling time between thermal doses, and

electrical properties for the heat applying element.

5. The treatment system of claim 3, wherein the user specified thermal dose prediction properties include at least one of:

overrides for any default thermal dose prediction properties,

treatment site grid density, and

thermal dose prediction properties not specified as default thermal dose prediction properties from the group comprised of: thermal dose threshold, thermal dose prediction algorithm, maximum allowed energy for each thermal dose, thermal dose duration for each treatment site cooling time between thermal doses, and electrical properties for the heat applying element.

6. The treatment system of claim 1, wherein the treatment plan ensures that the entire target mass is covered by a series of thermal doses so as to obtain a composite thermal dose sufficient to ablate the entire target mass.

~~7~~ 6. The treatment system of claim 1, wherein the thermal dose properties are automatically optimized using physiological properties as the optimization criterion.

~~8~~ 7. The treatment system of claim 1, wherein the planner limits the thermal dose at each treatment site in order to prevent carbonization or evaporation.

~~9~~ 8. The treatment system of claim 1, wherein the planner constructs a predicted thermal dose distribution illustrating the predicted thermal dose contours of each treatment site in the treatment plan.

~~10~~ 9. The treatment system of claim 1, further comprising a User Interface (UI) for entering user specified thermal dose prediction properties and for editing the treatment plan once the treatment plan is constructed.

~~11~~ 10. The treatment system of claim 1, wherein the treatment plan is constructed in three dimensions.

~~12~~ 11. The treatment system of claim 1, further comprising a feedback imager for providing thermal images illustrating the actual thermal dose distribution resulting at each treatment site.

~~13~~ 12. The treatment system of claim ~~12~~ 11, wherein the imager acts as the feedback imager.

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14. The treatment system of claim 1, wherein the heat applying element applies one of the following

ultrasound energy,

laser light energy,

RF energy,

microwave energy, and

electrical energy.

15. A focused ultrasound system, comprising:

a transducer for generating ultrasound energy that results in thermal doses used to ablate a target mass in a patient;

a controller for controlling thermal dose properties of the transducer;

an imager for providing preliminary images of the target, and for providing thermal images illustrating an actual thermal dose distribution in the patient; and

a planner for automatically constructing a treatment plan using the preliminary images, the treatment plan comprising a series of treatment sites represented by a set of thermal dose properties used by the controller to control the transducer.

16. The focused ultrasound system of claim 15, wherein the planner further constructs a predicted thermal dose distribution illustrating the predicted thermal dose contours of each treatment site in the treatment plan.

17. The focused ultrasound system of claim 16, wherein after a thermal dose is delivered to each treatment site in the treatment plan, the actual thermal dose distribution is compared to the predicted thermal dose distribution to determine remaining untreated locations within the target mass.

18. The focused ultrasound system of claim 16, wherein after a thermal dose is delivered to a treatment site in the treatment plan, the actual thermal dose distribution is compared to the predicted thermal dose distribution to determine changes to the dosing parameters in neighboring sonication sites.

19. The focused ultrasound system of claim 17, wherein the planner automatically evaluates the treatment plan based on the remaining untreated locations and updates the treatment plan to ensure complete ablation of the target mass is achieved by one or more of adding treatment sites, removing treatment sites, modifying existing treatment sites, or leaving the treatment plan unchanged.

20. The focused ultrasound system of claim 17, wherein a user can manually adjust the treatment plan based on the remaining untreated locations.

21. The focused ultrasound system of claim 17, wherein the preliminary images and the thermal images represent three-dimensional data.

22. The focused ultrasound system of claim 17, wherein the predicted thermal dose distribution and actual thermal dose distribution represent three-dimensional data.

23. The focused ultrasonic system of claim 15, wherein the imager further provides outlines of sensitive regions within the patient where ultrasonic waves are not allowed to pass.

24. The focused ultrasonic system of claim 23, wherein the processor uses the outlines in constructing the treatment plan so as to avoid exposing the sensitive regions to ultrasound.

25. The focused ultrasound system of claim 23, wherein the sensitive regions comprise bones, gas, and other sensitive tissues.

26. A method of controlling thermal dosing in a thermal treatment system, comprising:

selecting an appropriate clinical application, the selected application having associated with it certain default thermal dosing properties;

retrieving relevant images for thermal dose planning;

tracing a target mass on the images;

entering user specified thermal dosing properties and selectively modifying the default thermal dosing properties; and

automatically constructing a treatment plan representing thermal doses to be applied to treatment sites, the treatment plan based on the default thermal dosing properties and the user specified thermal dosing properties.

27. The method of claim 26, wherein tracing the target mass is done manually or automatically.

28. The method of claim 27, wherein tracing the target mass further comprises evaluating the target mass to ensure that obstacles including bones, gas, or other sensitive tissue will not interfere with the thermal doses and repositioning a patient or a heat applying element in order to bypass any such obstacles.

29. The method of claim 26, wherein the treatment plan ensures that a target mass receives a composite thermal dose sufficient to ablate the target mass.

30. The method of claim 29, wherein automatically constructing the treatment plan further comprises predicting and displaying a predicted thermal dose distribution.

31. The method of claim 25, wherein said thermal dose distribution represents three-dimensional data.

32. The method of claim 26, wherein automatically constructing the treatment plan further comprises calculating limits for each thermal dose to be applied to each treatment site in order to prevent carbonation or evaporation.

33. The method of claim 26, further comprising manually editing the treatment plan after it is constructed.

34. The method of claim 33, wherein manually editing the treatment plan comprises at least one of

adding treatment sites,

deleting treatment sites,

changing the location of treatment sites,

changing thermal dosing properties, and

reconstructing the entire treatment plan with new thermal dosing properties.

35. The method of claim 26, further comprising

applying a low energy thermal dose at a predetermined spot within the target mass in order to verify proper registration, and

evaluating said predetermined spot and adjusting and/or re-verifying if necessary.

36. The method of claim 26, further comprising

applying a full energy thermal dose at a predetermined spot within the target mass in order to verify proper thermal dosing parameters, and

correcting, either automatically or manually, for neighboring sonication sites.

37. The method of claim 26, further comprising

implementing the treatment plan,

capturing temperature sensitive image sequences of the target mass as each step of the treatment plan is executed, wherein said temperature sensitive images illustrate an actual thermal dose distribution resulting from each thermal dose in the treatment plan,

comparing the actual thermal dose distribution with a predicted thermal dose distribution as each step of the treatment plan is executed, and

editing remaining treatment sites in the treatment plan based on results of comparing the actual thermal dose distribution with the predicted thermal dose distribution.

38. The method of claim 35, wherein editing the remaining treatment sites comprises at least one of

adding treatment sites,

deleting treatment sites,

repeating treatment sites, and

modifying the thermal dosing properties associated with all or some of the treatment sites in the treatment plan.